

The purpose of the ADG is to develop better communication between Dendrobatid breeders in North America. It is designed, by its format and bi-monthly distribution, to provide current information and new developments in the hobby. We hope that this will aid us in solving some of the problems which confront us all. This newsletter appears bimonthly at a cost \$10.00 per calander year. Back issues for 1992 are available for \$5.00; back issues for 1993 are available for \$10.00.

Subscriptions, comments, etc. should be sent to Charles Powell (2932 Sunburst Dr., San Jose, CA 95111 Tel.: (408) 363-0926).

NOTES FROM THE EDITOR

I am still looking for photographs and/or slides to be used for a color insert for the next Newsletter. Please make copies today of your best photographs and send them to the address above. Also the contest for a Newsletter banner is still in progress so please submit your art work today. Winners will be announced in the January-February 1995 issue of the Newsletter.

KITCHEN COUNTER FROG PATHOLOGY: PART 1

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The protocols in the following passage are based largely upon my personal experience, the theoretical application of other veterinary procedures to poison-dart frogs, and a large dose of common sense. These protocols are by no means absolute, and any contributions anyone can make to this area of husbandry would be greatly appreciated, not only by me, but by anyone raising frogs. If anyone would like to communicate any experiences in the area of dart-frog medicine, or has any questions about the following procedures, please feel free to contact me at the above address.

In recent years, the number of reptiles and amphibians in private and public collections has grown considerably. In addition, greater awareness of the world's ecosystems; the knowledge that wild-caught animals are not an endless resource; and massive, modern publishing and telecommunication methods have allowed an explosion of herpetile husbandry information, especially concerning captive breeding. However, there is one area of captive herp husbandry that has been largely neglected, particularly by private

collectors — veterinary medicine.

We have all had frogs get sick and/or die on us. Often, these illnesses and deaths are mysterious. A frog seems sluggish and is not eating. A week later, the frog is either dead, or everything is back too normal. We mourn the loss (or celebrate the small miracle), dump in a handful of fruit flies, and our typical routine resumes. Nine times out of ten, our inaction does no harm. But that tenth time: I don't know how many horror stories I've heard from collectors whose ignorance of a situation results in complete disaster (such as the loss of an entire collection!). So, how do we go about finding out what ails that sick frog? What do we do to save our charges? What can we do to prevent similar episodes in the future? Where do we start?

In general, the collector is presented with two scenarios: The dead frog or the "sick" frog. In this article, I will deal with the dead frog, and what to do with it to help the collector prevent future epidemics or illnesses. The dead frog scenario is self-explanatory — you look into your terrarium and your prized (and only) female *D. reticulatus* is lying sprawled out on the sphagnum, obviously not alive. This situation is grievous, but it is not a total loss. At the very least, you stand to advance your personal knowledge of dart-frog husbandry, so don't just get angry and pitch your dead frog in the toilet; don't get mad, get curious. The corpse that you now possess could be the key to preventing many more deaths in your collection.

First, the environment of your terrarium is not suited to preserving dead tissue, so act quickly. A rotten frog is practically useless, pathologically speaking. Get the corpse into the refrigerator in a sealed plastic bag. Do not let the corpse sit in the 'fridge for several days! Attend to the body preferably in the first twelve hours! If you cannot deal with the corpse during this time frame, then drop the entire frog into a 10% formalin solution. Be sure to make an incision along its abdomen so the internal organs are preserved as well. Unfortunately, this will kill most pathogens that may be present, but it does preserve the affected tissues for later study. Next, either prepare to dissect the frog and do a post-mortem yourself, or contact a veterinarian or a pathologist who would be willing to do a post-mortem and let you watch. This second item is very important, simply because most veterinarians have never encountered an amphibian (let alone a poison-dart frog) in their professional experience. In this instance, your personal experience and knowledge of these animals can be invaluable to making a correct diagnosis of the cause of death. A possible third option would be to ship the corpse to a person with more experience, and let them complete a post-mortem for you. Considering the cost of these frogs (including food, heat, space, and time invested), the mere possibility of saving just one frog in your collection makes the time/cost of a post-mortem not only cost-effective, but necessary.

Doing a post-mortem by oneself is feasible, but it does require some forethought and planning. You will need to have on hand a compound microscope, microscope slides, cover slips, Gram's and Wright's stain solutions, normal saline (0.9%), methyl alcohol, 10% formalin, small vials or jars for tissue samples, a magnifying glass, scalpel blades (a safety razor blade will do), stick pins, forceps, fine point scissors, several syringes with fine gauge needles (preferably the type used by diabetics), a light source (penlight), and something to

take notes on. These are the bare necessities, and will allow a fair post-mortem. Ideally, one would benefit from having sterile culturettes (cotton swabs with a nutrient agar that allow for the collection and culture of pathogenic organisms), a dissection microscope, a text on frog morphology, a text on microbiology, and a text on diseases and pathological conditions of amphibians (The Veterinary Clinics of North America: Exotic Animal Medicine I, Vol. 23:6, November 1993 has a good section on amphibian medicine.).

Next, find a surface where you can work, preferably white or light colored, and wipe it down with a disinfectant, such as a dilute bleach solution. This sterilizes the surface and prevents contamination of samples. Warn the household if you are going to do dissect a frog on the kitchen counter! If you can find one, a dissecting tray with white wax is ideal. A tray can be easily made by melting several white candles and pouring the wax into the bottom of a cake pan to a depth of about 3/4 inch. Sterilize the surface of the dissecting tray with the dilute bleach solution. Lay the frog on its back, and pin its legs apart, in a spread-eagle fashion. Wet the frog down with the saline solution to keep it from drying out. This will also keep any protozoan organisms on the skin alive.

HELPFUL HINTS

All this months "Helpful hints" come from Jack H. Wattley of Florida. "Taking a page from our tropical fish business we've found that developing tadpoles (as with our young discus fish) grow much better in hard water than in soft, mineral free water. I feel certain that tadpoles need the minerals for both bone and tissue growth. The soft water that many use for raising tadpoles may be the reason for problems with your developing froglets."

Jack has also recognized a problem in feeding young froglets strickly on a diet of young crickets. He states we've lost a small number of juvenile frogs from what seems to be the over feeding of small, three day old crickets, as we found undigested crickets in all the frogs that died. He believes you cannot over feed with *Drosophila*, as we never had this problem using fruit-flies.

And lastly he states "Last summer my son and I went down to the Brazil/Suriname border and with the help of the local Akuriyo Indians were able to bring back a number of frogs, mainly *D. tinctorius* and *D. azureus*. We now have young from these frogs. It was interesting that in the area where we found the frogs in Brazil, known as the Sipaliwini Savannah, the abient temperature was approximately 85°F (30°C). In this area we found three color forms of *D. azureus*. Most were the regular blue with black spots, but others were completely blue, while others were a much lighter blue/green in the forward area of the back. The *D. tinctorius* in an area a bit further north were what we refer to here in the USA as Powder-blue *tinctorius*.

NEW LITERATURE

Atelopids

La, Marca, Enrique, 1983, A new frog of the genus *Atelopus* (Anura: Bufonidae) from a Venezuelan cloud forest. Milwaukee Public Museum, Contributions in Biology and Geology, No. 54: 1-12.

Dendrobatids

Bradley, David, 1993, Frog venom cocktail yields a one-handed painkiller. *Science*, 261(1117). (see also letters to *Science* by Myers, Charles W. and Daly, John W., 1993, Tropical poison frogs. *Science*, 262: 1193 for a brief discussion of Bradley's article and a reply by Jones, Marshall P., 1994, Frog endangerment. *Science*, 263: 13).
Frenkel, Jack K. and Harman, W. J., 1985, *Allodero hylae* endoparasitic worn (Naididae, Oligochaeta, Annelida) from a Colombian Poison dart frog *Dendrobates histrionicus*: ureteral and cloacal habitat and visceral migration. The American Society of Parasitology, Abstracts: 36.

ADDS: For Sale

<i>Dendrobates auratus</i> 'Hawaii'	\$25 ea.	Eric Anderson 12231 Newberry Rd. Gainesville, FL 32607
<i>Dendrobates leucomelas</i> 'Orange'	\$60 ea.	
<i>Dendrobates tinctorius</i> 'Cobalt'	\$40 ea.	
<i>Dendrobates tinctorius</i> 'Brazil' (lots of yellow)	\$60 ea.	
<i>Epipedobates tricolor</i> (3 morphs)	\$30 to \$50 ea.	
<i>Dendrobates leucomelas</i> 'Orange'	\$70 ea.	Jeffrey Lee Department of Chemistry Duke University Durham, NC 27708 (919) 382-3059
<i>Dendrobates leucomelas</i>	\$40 to \$60	Anthony Leiro 402 Holly Lane Chapel Hill, NC 27514 (919) 929-3522
<i>Dendrobates tricolor</i> (brick red with light blue stripes)	\$40 ea.	Patrick Nabors St. Louis Lizard Co. 9849 Manchester St. Louis, MO 63119 (800) 962-7280
<i>Dendrobates auratus</i> 'Zwartgroene' form' (a Panamanian form which is 80% black)	\$50 ea.	Charles Powell 2932 Sunburst Dr. San Jose, CA 95111 (408) 363-0926

<i>Epipedobates trivittatus</i>	\$75 ea.	Lex Thomas (904) 375-5689
<i>Dendrobates azureus</i> (F1 from wild caught adults)	\$150 ea	Jack H. Wattley 2500 Sea Island Dr. Ft. Lauderdale, FL 33301 (304) 436-5011 or (304) 463-4716 FAX (305) 463-4716

Reptile Specialities (John Uhern, 10051 Commerce, Tujunga, CA 91042 Tel. (818) 352-1796; Fax (818) 353-7381) have various captive breed Dendrobatids imported from Germany for sale. Write or call for information.

Wanted:

Dendrobates leucomelas - male

Brice Noonan
2580 53rd Terrace SW
Naples, FL 33999
(813) 455 5385

Dendrobates azureus - female

Charles L. Powell, II
2932 Sunburst Dr.
San Jose, CA 95111
(408) 363-0926

NEW MEMBERS

C & B Distributors (Florida)
David Carrell (Illinois)
Rob Coke (Texas)
Ivan Hartley (Florida)
Nestor Raul Jaramillo (Florida)
Matt McMahon (Pennsylvania)
Ryan Mickael (California)
William Sheldon (California)
Dave Wright (Nevada)

Pairing chances: the following table shows the chances of getting a pair of frogs given a 1:1 sex ratio of frogs in a given population of collected or breed frogs.

Number of frogs	No Pairs	Number of Pairs				At least one pair
		1	2	3	4	
1	100%	0	0	0	0	0
2	50%	50%	0	0	0	50%
3	25%	75%	0	0	0	75%
4	13%	38%	50%	0	0	88%
5	6%	31%	63%	0	0	94%
6	3%	19%	47%	31%	0	97%
7	2%	11%	33%	55%	0	98%
8	1%	6%	21%	44%	27%	99%

Taken from Wood, Allen, 1993, What are the chances? Southern Colorado Aquarium Society Journal, 4(6): 13.